ZOOLOGIA 34: e13730
ISSN 1984-4689 (online)
zoologia.pensoft.net

RESEARCH ARTICLE

Taxonomy of Xylographellini (Coleoptera: Ciidae) from the Australian and Oriental regions with descriptions of new species of *Scolytocis* and *Xylographella*

Igor Souza-Gonçalves[1,2], Cristiano Lopes-Andrade[2]

[1]*Programa de Pós-Graduação em Ecologia, Departamento de Biologia Geral, Universidade Federal de Viçosa. 36570-900 Viçosa, MG, Brazil.*
[2]*Laboratório de Sistemática e Biologia de Coleoptera, Departamento de Biologia Animal, Universidade Federal de Viçosa. 36570-900 Viçosa, MG, Brazil.*
Corresponding author: Igor Souza-Gonçalves (igao_bio@yahoo.com.br)

http://zoobank.org/55B5AE5A-84AB-4963-BF0B-8C141703995D

ABSTRACT. Xylographellini beetles occur mainly in lands of the Southern Hemisphere. However, the taxonomy of Australian and Oriental species is incipient. The tribe comprises four genera, of which *Scolytocis* Blair, 1928 and *Xylographella* Miyatake, 1985 were recently redescribed and reported from Australia but without descriptions of new species. Here, three new species of Xylographellini are described: *Scolytocis australimontensis* **sp. n.** from Australia, with smooth interspaces of pronotal punctures; *Scolytocis insularis* **sp. n.** from the Pohnpei Island (Caroline Islands, Micronesia), with microstriated interspaces of pronotal punctures; and *Xylographella frithae* **sp. n.** from Australia, with six raised keels in elytral declivity. *Scolytocis samoensis* Blair, 1928, type species of the genus, is recorded from Guam (Mariana Islands, Micronesia) and redescribed. Keys for the *Scolytocis* and *Xylographella* occurring in the Australian and Oriental regions are also provided.

KEY WORDS. Australia, ciid, Ciinae, Micronesia, minute tree-fungus beetles

INTRODUCTION

Xylographellini (Ciidae: Ciinae) comprises four genera in two subtribes (Lopes-Andrade 2008): *Xylographella* Miyatake, 1985 and *Scolytocis* Blair, 1928 in Xylographellina; and *Syncosmetus* Sharp, 1891 and *Tropicis* Scott, 1926 in Syncosmetina. Xylographellina occur in the Australian (New Zealand), Oriental (Philippines, Fiji and Samoa) and Palearctic (Japan) regions, throughout the Neotropical region, and in the Chinese transition zone (Lopes-Andrade 2008, Lopes-Andrade and Grebennikov 2015). Syncosmetina occur in the Ethiopian region (islands of the Indian Ocean), Palearctic region (Japan) and in the Chinese transition zone (biogeographic regionalization sensu Morrone 2015). The distribution of these subtribes overlaps in the Chinese transition zone, with one species of *Scolytocis* and four of *Syncosmetus* (Lopes-Andrade and Grebennikov 2015), and in Japan, with one species of *Xylographella* and two of *Syncosmetus* (Lopes-Andrade 2008). Up to date there is only one species of Xylographellini from the Australian region, *Scolytocis novaezelandiae* Lopes-Andrade, 2008. Whereas the Oriental Xylographellini comprise *Xylographella speciosa* Lopes-Andrade, 2008 and six species of *Scolytocis*: *Scolytocis malayanus* Lopes-Andrade, 2008, *Scolytocis philippinensis* Lopes-Andrade, 2008, *Scolytocis samoensis* Blair, 1928, *Scolytocis thayerae* Lopes-Andrade, 2008, *Scolytocis werneri* Lopes-Andrade, 2008, and *Scolytocis zimmermani* Lopes-Andrade, 2008 (Lopes-Andrade 2008). *Scolytocis* and *Xylographella* were recently redescribed and reported from Australia (Lawrence 2016).

Our objective is to describe three new species of Xylographellini: *Scolytocis australimontensis* sp. n. and *Xylographella frithae* sp. n. from the Australian region; and *Scolytocis insularis* sp. n. from the Oriental region. Moreover, *Sc. samoensis* is recorded for the first time from Guam (Mariana Islands) and redescribed. Identification keys to Australian and Oriental *Scolytocis* and to all known species of *Xylographella* are also provided.

MATERIAL AND METHODS

Generic limits follow Lopes-Andrade (2008) and Lawrence (2016). The number of available specimens was low, but some were dissected in attempts to find males. Holotypes were not

dissected, so their sexes are undetermined. Among the paratypes two males of *Xylographella frithae* sp. n. were found, one from Paluma and the other from Hugh Nelson Range, Queensland. The tegmen shown in Fig. 22 is of a paratype from the type locality (Paluma). The sternite VIII and aedeagus shown in Figs 21 and 23, respectively, are of a paratype from Hugh Nelson. The aedeagus extracted from a male paratype from the type locality was a bit damaged during dissection, but it was carefully compared to the aedeagus extracted from the male from Paluma. We were unsuccessful in finding males in good condition from the two new species of *Scolytocis*. We recognized two males *Sc. samoensis* from Guam, but their genitalia were very membranous and deformed by agglomeration of nematodes. The following female paratypes were dissected: three *Sc. australimontensis* sp. n. (from Mount Haig, Hugh Nelson Range and Mossman Bluff Track, Queensland); one *Sc. insularis* sp. n. from Kolonia (Pohnpei Island, formerly known as Ponape Island); two *Sc. samoensis* from Guam; and one *X. frithae* sp. n. from Mount Lewis (Queensland). We provide only the ratio of gula width to head width, which seems to be the same for both sexes in species of *Scolytocis* and *Xylographella* (Lawrence 2016).

The terminology for the external morphology of adult ciids follows Lawrence et al. (2011), Lawrence (2016) and Lopes-Andrade and Lawrence (2005, 2011). The following abbreviations are used for measurements (in mm) and ratios: BW (basal width of scutellar shield), CL (length of antennal club measured from base of the eighth to apex of the tenth antennomere in *Xylographella*; from base of the seventh to apex of the ninth antennomere in *Scolytocis*), EL (elytral length along the midline), EW (greatest width of elytra together), FL (length of antennal funicle measured from base of the third to apex of the seventh antennomere in *Xylographella*, or to the apex of the sixth antennomere in *Scolytocis*), GD (greatest depth of body measured in lateral view), GW (greatest diameter of eye), PL (pronotal length along midline), PW (greatest pronotal width), TL (total length counted as EL + PL, i.e. excluding head). The GD/EW and TL/EW ratios indicate degree of body convexity and elongation, respectively.

Scolytocis danae Lopes-Andrade & Grebennikov, 2015, is included in the key to Oriental *Scolytocis*. Although it is known only from the Chinese transition zone, it is morphologically closely related to the oriental *Sc. philippinensis*, *Sc. thayerae* and *Sc. zimmermani* (Lopes-Andrade and Grebennikov 2015). Only a single specimen of *Sc. danae* is known; the lowest limit of its TL provided in the key was estimated as being 2.10 mm considering that the highest TL in a species of *Scolytocis* is about 15% more than the lowest TL (see measurements in Lopes-Andrade 2008).

Transcription of labels, dissection, photography and measurement of specimens follow the methods provided by Araujo and Lopes-Andrade (2016). The distribution map (Fig. 24) was created in the freeware QGIS 2.14.2. The examined specimens were deposited in the following collections: ANIC – Australian National Insect Collection, CSIRO Entomology (Canberra, Australia); CELC – Coleção Entomológica do Laboratório de Sistemática e Biologia de Coleoptera, Universidade Federal de Viçosa (Viçosa, Minas Gerais, Brazil); QMBA – Queensland Museum (Brisbane, Australia).

TAXONOMY

Key to Australian and Oriental species of *Scolytocis* Blair

1 Metatibiae with outer edge straight (Fig. 5) to barely rounded (Fig. 10), usually with a clear distinction between outer and apical edges; spines of outer edge separated by one spine-width or more (Figs 5, 10, 15). If distinction of outer and apical edges of metatibiae is not clear (Fig. 10), then TL is less than 1.16 mm..... 5

1′ Metatibiae with outer edge broadly rounded, without a distinction between outer and apical edges; spines of outer edge very close to each other at apical half and TL at least 1.26 mm.....2

2 Apical antennomere of club longer than preceding two antennomeres together 4

2′ Apical antennomere of club shorter than preceding two antennomeres together 3

3 Prosternum with longitudinal carina in front of coxae conspicuous. TL less than 1.40 mm. Known from the Philippines.. *Scolytocis philippinensis* Lopes-Andrade, 2008

3′ Prosternum devoid of a longitudinal carina in front of coxae. TL more than 2.10 mm. Known from southeast China..... .....*Scolytocis danae* Lopes-Andrade & Grebennikov, 2015

4 Prosternum biconcave. TL more than 1.70 mm. Known from the Philippines .... *Scolytocis thayerae* Lopes-Andrade, 2008

4′ Prosternum concave. TL less than 1.70 mm. Known from Fiji..... *Scolytocis zimmermani* Lopes-Andrade, 2008

5 Pronotum with a rugose border along the posterior edge..8

5′ Pronotum lacking a rugose border along the posterior edge, the surface similar to that of pronotal disc 6

6 CL/FL at least 1.80. Known from Malaysia..... ..... *Scolytocis malayanus* Lopes-Andrade, 2008

6′ CL/FL 1.60 or less 7

7 Metatibiae with a clear distinction between outer and apical edges (Fig. 15); outer edge straight and bearing few spines (usually three; Fig. 15). Known from Samoa and Guam..... *Scolytocis samoensis* Blair, 1928

7′ Metatibiae without a clear distinction between outer and apical edges (Fig. 10); outer edge slightly rounded and bearing much more than three spines (Fig. 10). Known from the Pohnpei Island (Micronesia)..... .....*Scolytocis insularis* sp. n.

8 Pronotum with interspaces of punctures smooth. Known from Australia..... *Scolytocis australimontensis* sp. n.
8' Pronotum with interspaces of punctures microreticulate... 9
9 Posterior pronotal edge with a narrow rugose border. Metaventrite bearing a conspicuous and long discrimen. Known from the Philippines..... ..... *Scolytocis werneri* Lopes-Andrade, 2008
9' Posterior pronotal edge with a broad rugose border. Discrimen short, not reaching the middle of metaventrite. Known from Northern New Zealand..... ..... *Scolytocis novaezelandiae* Lopes-Andrade, 2008

Scolytocis australimontensis sp. n.

http://zoobank.org/F5B169D2-9A4D-499A-85DB-F56BC5E16167
Figs 1–5, 24

Scolytocis sp. in Lawrence (2016: 198).

Type locality. Mount Haig, state of Queensland, northeastern Australia (17°06'S, 145°29'E).

Diagnosis. *Scolytocis australimontensis* sp. n. can be distinguished from other Australian and Oriental species of *Scolytocis* by the combination of the following features: pronotum with a conspicuous rugose border along the posterior edge and smooth interspaces of punctures; metatibiae with a clear distinction between the outer and apical edges, the outer edge being straight and bearing at least five spines separated from each other by more than a spine-width. *Scolytocis novazelandiae* has a similar posterior pronotal border, but interspaces of punctures are microreticulate. *Scolytocis werneri* has a comparatively narrower posterior pronotal border and interspaces of punctures are coarsely reticulate.

Description, holotype (Figs 1–5). Adult fully pigmented. Measurements in mm: TL 1.15, PL 0.38, PW 0.50, EL 0.78, EW 0.58, GD 0.50. Ratios: PL/PW 0.75, EL/EW 1.35, EL/PL 2.07, GD/EW 0.87, TL/EW 2.00. Body elongate, convex; dorsum and venter dark reddish-brown; antennae, palpi and tarsi yellowish-brown; dorsal vestiture of minute setae, smaller than a puncture-width and barely discernible even in high magnification (150×), except for the posteriormost portion of elytra with conspicuous setae (easily seen in lateral view); venter subglabrous. Head with anteriormost portion visible from above; dorsum with shallow, coarse punctures, separated from each other by a puncture-width or less and with smooth interspaces. Antennae bearing nine antennomeres, as follows (in mm, left antenna measured): 0.06, 0.04, 0.03, 0.02, 0.01, 0.01, 0.03, 0.03, 0.06 (FL 0.07, CL 0.12, CL/FL 1.71). Eyes finely facetted, each bearing about 70 ommatidia; GW 0.11. Gula 0.52 times as wide as head. Pronotum with shallow, single punctation; punctures irregular, separated from each other by a puncture-width or less and with smooth interspaces; anterior edge broadly rounded; lateral edges smooth, not explanate and not visible when seen from above; posterior edge with a rugose border along it. Scutellar shield triangular, bearing fine punctures; BW 0.10. Elytra with shallow, dual punctation; large punctures coarse, seriate, about twice as large as small punctures; small punctures sparsely and irregularly distributed; interspaces of punctures, smooth; elytral apex truncate; apical declivity concave with conspicuous cuticular globules (Fig. 4, arrows). Hind wings developed, apparently functional. Hypomera with coarse, shallow punctation; each puncture bearing a fine decumbent seta; interspaces microreticulate. Prosternum in front of coxae concave; interspaces microreticulate. Prosternal process laminate, as long as prosternum at midline, apex acute. Pro-, meso- and metatibiae (Fig. 5, left metatibia of a paratype) with similar shape and length, approximately three times as long as broad; tibiae with distinct apical and outer lateral edges; outer apical angle rounded; outer edge of tibiae straight and with about five spines separated from each other by more than a spine-width; apical edge with about 10 spines very close to each other. Metaventrite with coarse, shallow punctures; interspaces microreticulate; discrimen about half the length of metaventrite at midline. Abdominal ventrites with coarse, small punctures, separated from each other by a puncture-width or less; interspaces microreticulate; length of ventrites (in mm, from base to apex at the longitudinal midline) as follows: 0.15, 0.05, 0.05, 0.05, 0.10.

Measurements (in mm) and ratios (n = 7, including the holotype): TL 1.10–1.33 (1.16 ± 0.07), PL 0.38–0.43 (0.39 ± 0.02), PW 0.45–0.55 (0.48 ± 0.04), EL 0.70–0.90 (0.77 ± 0.06), EW 0.50–0.63 (0.55 ± 0.04), GD 0.45–0.55 (0.49 ± 0.03), PL/PW 0.75–0.89 (0.82 ± 0.05), EL/EW 1.33–1.55 (1.41 ± 0.08), EL/PL 1.75–2.12 (1.96 ± 0.14), GD/EW 0.86–0.95 (0.88 ± 0.03), TL/EW 2.00–2.30 (2.13 ± 0.10).

Material examined. Australia: holotype (ANIC) labeled "17.06S 145.29E QLD, Mt. Haig 1150 m GS1, 1 Dec. 1994 – 3 Jan. 1995, P. Zborowski, FI Trap ANIC [printed]*Scolytocis australimontensis* Souza-Gonçalves & Lopes-Andrade HOLOTYPUS [printed on red paper]". Paratypes: 8 specimens (3 females and 5 with gender not determined) as follows: one female (ANIC, dissected) and 2 specimens (CELC), same locality data as holotype; one specimen (CELC) "17.06S 145.37E QLD, Mt. Edith GS2, 1050 m, 3 Jan. – 4 Feb. 1995, P. Zborowski, FI Trap ANIC [printed]"; one female (CELC, dissected) "17.27S 145.29E QLD, Hugh Nelson Rg. GS3 1150 m, 1 Dec. 1994 – 3 Jan. 1995, P. Zborowski, FI Trap ANIC [printed]"; one specimen (ANIC) "Mt. Lewis, 800 m, QLD, 26 Dec. 1986, H. & A. Howden, flight intercept trap [printed]"; one specimen (QMBA) "Mt Bartle Frere, N. Qld. Sth. Peak Summit, 1620 m, 6–8 Nov. 1981, EARTHWATCH/QLD MUSEUM, *Pyrethrum* knockdown [printed]\QUEENSLAND MUSEUM LOAN DATE: Dec. 2001 No. LE 01.28 [printed on green paper]\A.N.I.C. COLEOPTERA Voucher No. 83-0880 [printed on green paper]"; one female (QMBA) "Mossman Bluff Track, 5–10 Km W. Mossman N. Qld, 20 Dec 1989 – 15 Jan 1990, Monteith, Thompson & ANZSES Site 7,1000 m, flt. intercept [printed]\QUEENSLAND MUSUEM LOAN DATE: Dec. 2001 No. LE 01.36

Figures 1–5. Holotype of *Scolytocis australimontensis* sp. n. from Queensland, Australia: (1) dorsal view; (2) lateral view; (3) ventral view; (4) apical declivity of elytra; (5) left metatibia. Scale bars: 0.5 mm (1–3); 0.2 mm (4); 0.1 mm (5).

[printed on green paper]". All paratypes are additionally labeled \ *Scolytocis australimontensis* Souza-Gonçalves & Lopes-Andrade PARATYPUS [printed on yellow paper].

Etymology. The species name derives from the Latin adjectives "australis", which means "of the South" and refers to Australia, and "montensis", which means "of or belonging to mountains", both in the genitive singular. The name is a reference to the Australian mountains where most specimens were collected.

Remarks. This new species was collected only in localities above 800 m, three of them at Australian mountains (Mount Haig, Mount Edith and Mount Bartle Frere) (Fig. 24). This species may be included in the *Sc. werneri* species-group, in which the species have a rugose border along the posterior pronotal edge.

Scolytocis insularis sp. n.

http://zoobank.org/A16E8CB3-2403-495E-AD46-34B12386ED83
Figs 6–10, 24

Type locality. Kolonia, Pohnpei Island, state of Pohnpei, Federated States of Micronesia (6°57'N, 158°12'E).

Figures 6–10. Holotype of *Scolytocis insularis* sp. n. from Pohnpei Island, Micronesia: (6) dorsal view; (7) lateral view; (8) ventral view; (9) apical declivity of elytra, (10) left metatibia. Scale bars: 0.5 mm (6-8); 0.2 mm (9); 0.1 mm (10).

Diagnosis. *Scolytocis insularis* sp. n. can be distinguished from other Australian and Oriental species of *Scolytocis* by combination of the following features: pronotum with interspaces of punctures microstriated and posterior edge devoid of a rugose border; metatibiae without a clear distinction between outer and apical edges, the outer edge being slightly rounded.

Description, holotype (Figs 6–10). Adult apparently not fully pigmented but in good condition, except for lacking the right antenna and one tarsus. Measurements in mm: TL 1.08, PL 0.35, PW 0.48, EL 0.73, EW 0.48, GD 0.48. Ratios: PL/PW 0.74, EL/EW 1.53, EL/PL 2.07, GD/EW 1.00, TL/EW 2.26. Body elongate, convex; dorsum and venter yellowish brown; antennae, palpi and tarsi yellowish; dorsal vestiture of minute setae, smaller than a puncture-width and barely discernible even in high magnification (150×), except for the posteriormost portion of elytra with conspicuous setae (easily seen in lateral view); venter subglabrous. Head with anteriormost portion visible from above; dorsum with shallow, coarse, fine punctures, separated from each other by a puncture-width or less and with microreticulate interspaces. Antennae bearing nine antennomeres, as follows (in mm, left antenna measured): 0.06, 0.03, 0.04, 0.01, 0.01, 0.01, 0.03, 0.03, 0.05 (FL 0.07, CL 0.11, CL/FL 1.57). Eyes finely facetted, each bearing about 70 ommatidia; GW 0.11. Gula 0.47 times as wide as head. Pronotum with shallow, single

punctation; punctures irregular, fine, separated from each other by a distance of one to two puncture-widths on disc and one puncture-width close to the laterals; interspaces transversely microstriated on disc, diagonally microstriated near lateral edges; anterior edge broadly rounded; lateral edges smooth, not explanate and not visible when seen from above; posterior edge without a rugose border along it. Scutellar shield triangular, bearing small punctures; BW 0.12. Elytra with confuse, shallow punctation; punctures coarsely and irregularly distributed, with somewhat rugose interspaces; elytral apex truncate; apical declivity (posterior one-fourth of elytra) with conspicuous cuticular globules (Fig. 9, arrows). Hind wings developed, apparently functional. Hypomera with coarse, shallow punctation; each puncture bearing a fine decumbent seta; interspaces transversely microstriated. Prosternum in front of coxae biconcave; interspaces transversely microstriated. Prosternal process laminate, as long as prosternum at midline, apex acute. Pro-, meso- and metatibiae (Fig. 10, left metatibia) with similar shape and length, approximately three times as long as broad, expanded from base to basal two-thirds; tibiae with outer edge slightly rounded, devoid of a clear distinction of outer and apical edges; outer edge with about 15 spines, a bit sparser near tibial base and getting closer until apex. Metaventrite with coarse, small punctures; interspaces transversely microstriated; discrimen about two-fifths the length of metaventrite at midline. Abdominal ventrites with coarse, small punctures, separated from each other by a puncture-width or less; interspaces transversely microstriated; length of ventrites (in mm, from base to apex at the longitudinal midline) as follows: 0.12, 0.05, 0.05, 0.05, 0.09.

Measurements (in mm) and ratios (n = 2, including the holotype): TL 1.05–1.15, PL 0.35–0.38, PW 0.48–0.48, EL 0.73–0.78, EW 0.48–0.53, GD 0.48–0.49, PL/PW 0.74–0.79, EL/EW 1.48–1.53, EL/PL 2.07, GD/EW 0.95–1.00, TL/EW 2.19–2.26.

Material examined. Federated States of Micronesia: holotype (ANIC) labeled "PONAPE ISLAND: Colonia, iii.1998, H. S. Dybas, FMHN [printed]*Scolytocis insularis* Souza-Gonçalves & Lopes-Andrade HOLOTYPUS [printed on red paper]". Paratype: one female (CELC, dissected), same locality data as holotype and additionally labeled*Scolytocis insularis* Souza-Gonçalves & Lopes-Andrade PARATYPUS [printed on yellow paper].

Etymology. The species name is a Latin adjective in the genitive singular and means relative or belonging to an island, in reference to the insular distribution of this species.

Remarks. This new species is known only from the type locality, Kolonia, a coastal town and capital of the state of Pohnpei in the Federated States of Micronesia (Fig. 24). The species does not fit in any previously proposed species-group of *Scolytocis*. Here, we propose the *Sc. insularis* species-group to encompass this single species, the group defined by the combination of the following features: biconcave prosternum; outer edge of metatibiae slightly rounded, without a clear distinction between outer and apical edges. The prosternum is also biconcave in species of the *Scolytocis danielssoni* and the *Scolytocis fritzplaumanni* species-groups. However, in the *Sc. danielssoni* species-group the species are comparatively larger and have a rugose border along the posterior pronotal edge. In the *Sc. fritzplaumanni* group the species are also larger than *Sc. insularis* and bear a smooth border along the posterior pronotal edge. Metatibiae with slightly rounded outer edge are also seen in species of the *Scolytocis bouchardi* and the *Scolytocis lawrencei* species-group, but they have triconcave and tumid prosternum, respectively, and are exclusively neotropical.

Scolytocis samoensis Blair, 1928

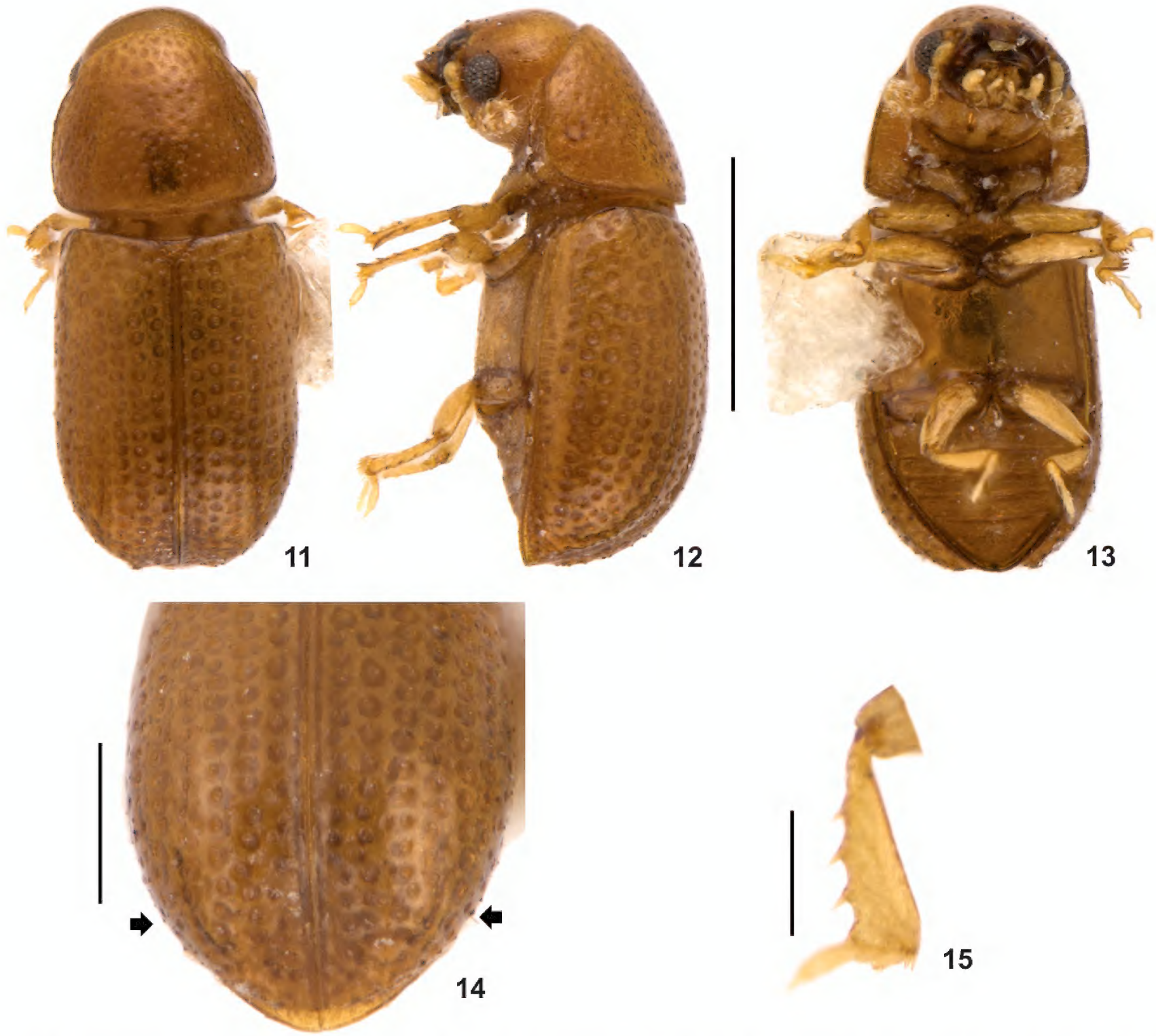
Figs 11–15, 24

Scolytocis samoensis: Blair 1928: 95–96 (description, type species of *Scolytocis* Blair, 1928, by original designation); Lopes-Andrade 2008: 14, 36 (inclusion in the *Sc. lawrencei* species-group, taxonomic notes).

Type locality. Pago Pago, Tutuila, Samoa, Polynesia (14°16'S, 170°42'W).

Diagnosis. *Scolytocis samoensis* can be distinguished from other Australian and Oriental *Scolytocis* by the following combination of features: pronotum devoid of a rugose border along the posterior edge; metatibiae with a clear distinction between outer and apical edges, the outer edge being straight and usually bearing three well-separated spines (Fig. 15); elytral punctation, seriate.

Redescription based in a specimen from Guam (Figs 11–15). Adult apparently not fully pigmented but in good condition. Measurements in mm: TL 1.03, PL 0.40, PW 0.45, EL 0.63, EW 0.50, GD 0.48. Ratios: PL/PW 0.89, EL/EW 1.25, EL/PL 1.56, GD/EW 0.95, TL/EW 2.05. Body elongate, convex; dorsum and venter yellowish brown; antennae, palpi and tarsi yellowish; dorsal vestiture of minute setae, smaller than a puncture-width and barely discernible even in high magnifications (150×), except for the posteriormost portion of elytra with conspicuous setae (easily seen in lateral view); venter subglabrous. Head with anteriormost portion visible from above; dorsal surface with shallow punctures, separated from each other by a puncture-width or less and with microreticulate interspaces. Antennae bearing nine antennomeres, as follows (in mm, left antenna measured): 0.06, 0.03, 0.02, 0.01, 0.01, 0.01, 0.02, 0.03, 0.03 (FL 0.05, CL 0.08, CL/FL 1.60). Eyes finely facetted, each bearing about 60 ommatidia; GW 0.10. Gula 0.50 as wide as head. Pronotum with shallow, single punctation; punctures irregular, separated from each other by a puncture-width or less; interspaces microreticulate; anterior edge broadly rounded; lateral edges smooth, not explanate and not visible when seen from above; posterior edge without a rugose border along it. Scutellar shield triangular, bearing small punctures; BW 0.08. Elytra with shallow, dual punctation; large punctures coarse, seriate, about twice as large as small punctures; small punctures sparsely and irregularly distributed; interspaces of punctures, smooth; elytral apex truncate; apical declivity



Figures 11–15. *Scolytocis samoensis* from Guam, Micronesia: (11) dorsal view; (12) lateral view; (13) ventral view; (14) apical declivity of elytra; (15) left metatibia. Scale bars: 0.5 mm (11–13); 0.2 mm (14); 0.1 mm (15).

concave with conspicuous cuticular globules (Fig. 14, arrows). Hind wings developed, apparently functional. Hypomera with coarse, shallow punctation; each puncture bearing a fine decumbent seta; interspaces microreticulate. Prosternum in front of coxae biconcave; interspaces microreticulate. Porsternal process laminate, as long as prosternum at midline, apex acute. Pro-, meso- and metatibiae (Fig. 15, left metatibia) with similar shape and length, approximately three times as long as broad; tibiae with a clear distinction between outer and apical edges; outer apical angle somewhat perpendicular; outer edge straight and bearing three well-separated spines; apical edge with about 10 spines very close to each other. Metaventrite with coarse, small punctures; interspaces, microreticulate; discrimen as long as metaventrite at midline. Abdominal ventrites with coarse, small punctures, separated from each other by a puncture-width or less; interspaces, microreticulate; length of ventrites (in mm, from base to apex at the longitudinal midline) as follows: 0.10, 0.04, 0.04, 0.04, 0.10.

Measurements (in mm) and ratios (n = 15): TL 1.00–1.23 (1.11 ± 0.07), PL 0.38–0.43 (0.40 ± 0.02), PW 0.43–0.53 (0.48 ± 0.03), EL 0.63–0.80 (0.71 ± 0.06), EW 0.48–0.55 (0.53 ± 0.03), GD 0.45–0.53 (0.50 ± 0.03), PL/PW 0.75–0.89 (0.83 ± 0.04), EL/EW 1.25–1.45 (1.34 ± 0.07), EL/PL 1.56–1.94 (1.79 ± 0.12), GD/EW 0.82–1.16 (0.95 ± 0.08), TL/EW 1.95–2.23 (2.10 ± 0.07).

Material examined. Guam: 15 specimens (8 ANIC; 7 CELC, including 2 dissected females) labeled "MARIANAS: Guam, Rititidian Point, 29.v.1945, #2086 FMNH in polypore, H. S. Dybas".

Remarks. *Scolytocis samoensis* is the type species of the genus and was described based on a single specimen from Samoa, possibly a female, deposited in the Bernice Pauahi Bishop Muse-

um (Hawaii, USA). Blair (1928) mentioned the poor condition of the holotype. This species was tentatively included in the *Sc. lawrencei* species-group by Lopes-Andrade (2008) and here we keep the same opinion. The specimens we examined from Guam (Fig. 24) fit the original description by Blair (1928).

Key to species of *Xylographella* Miyatake

1 Pronotum with interspaces of punctures microreticulate. Elytra with apical declivity (posterior one-third of elytra) smooth, lacking raised keels. Known from Japan ....*Xylographella punctata* Miyatake, 1985
– Pronotum with interspaces of punctures smooth. Elytra with apical declivity bearing raised keels 2
2 TL > 2.05 mm. Elytra with apical declivity bearing twelve raised keels (six in each elytron). Known from the Philippines .....*Xylographella speciosa* Lopes-Andrade, 2008
– TL < 1.90 mm. Elytra with apical declivity bearing six raised keels (three in each elytron). Known from Australia ....*Xylographella frithae* sp. n.

Xylographella frithae sp. n.

http://zoobank.org/3500CFF5-B5D1-41F6-8520-8E8C173E0BDB
Figs 16–24

Xylographella sp. in Lawrence (2016: 198).

Type locality. Paluma, state of Queensland, northeastern Australia (18°56'S, 146°10'E).

Diagnosis. *Xylographella frithae* sp. n. differs from *X. punctata* in possessing longitudinal raised keels at elytral declivity and in the smooth interspaces of pronotal punctures. It is closely related to *X. speciosa*, but differs in possessing six longitudinal raised keels at elytral declivity, rather than twelve, and in being comparatively smaller (TL less than 1.90 mm).

Description, holotype (Figs 16–20). Adult fully pigmented. Measurements in mm: TL 1.65, PL 0.60, PW 0.75, EL 1.05, EW 0.80, GD 0.73. Ratios: PL/PW 0.80, EL/EW 1.31, EL/PL 1.75, GD/EW 0.91, TL/EW 2.06. Body elongate, convex; dorsum and venter dark reddish brown; antennae, palpi and tarsi a bit lighter; dorsal vestiture of minute setae, smaller than a puncture-width and barely discernible even in high magnification (150×), except for the posteriormost portion of elytra with conspicuous setae (easily seen in lateral view); venter subglabrous. Head concealed by pronotum and not visible from above; dorsum with shallow punctures, separated from each other by a puncture-width or less and with microreticulate interspaces. Antennae bearing 10 antenommeres, as follows (in mm; left antenna measured): 0.09, 0.04, 0.06, 0.03, 0.02, 0.02, 0.02, 0.04, 0.04, 0.06 (FL 0.15, CL 0.14, CL/FL 0.93). Eyes finely facetted, each bearing about 80 ommatidia; GW 0.15. Gula 0.42 times as wide as head. Pronotum with moderately deep, single punctation; punctures irregular, separated from each other by a puncture-width or less and with smooth interspaces; anterior edge broadly rounded; lateral edges finely crenulate, not explanate and not visible when seen from above. Scutellar shield triangular, bearing a few punctures near lateral edges; BW 0.11. Elytra with coarse, deep, dual punctation; large punctures coarsely and irregularly distributed, deeper than those on pronotum, about twice as large as small punctures; small punctures sparsely and irregularly distributed; interspaces of punctures, smooth; elytral apex truncate; apical declivity (posterior one-third of elytra) bearing six raised keels (three in each elytron) converging to apex (Fig. 19, arrows). Hind wings developed, apparently functional. Hypomera with coarse, shallow punctation; each puncture bearing a fine decumbent seta; interspaces, microreticulate. Prosternum in front of coxae biconcave; interspaces, microreticulate. Prosternal process laminate, as long as prosternum at midline. Protibiae about three times as long as broad and expanded near apex; outer edge with spines extending from apex to almost its base; inner facet with a conspicuous tuft of long bristles along the apical two-fifths of the inner edge. Meso- and metatibiae (Fig. 20, left metatibia of a paratype) about four times as long as broad; outer edge with spines extending from apex to almost its base. Metaventrite with coarse, small punctures; interspaces, microreticulate; discrimen apparently absent. Abdominal ventrites with coarse, large punctures, separated from each other by a puncture width or less; interspaces, microreticulate; length of ventrites (in mm, from base to apex at the longitudinal midline) as follows: 0.22, 0.09, 0.08, 0.08, 0.17. Male terminalia in paratypes (Figs 21–23): sternite VIII (Fig. 21) with posterior margin rounded, bearing long setae medially; anterior portion with spiculum relictum. Tegmen (Fig. 22, tegmen alone; Fig. 23, tegmen with penis) about 4× as long as wide, sides straight and almost parallel; posterior half membranous and bearing a short median emargination at apex; anterior half sclerotized. Penis (Fig. 23, together with tegmen) about twice as long as tegmen; about 10× as long as wide; bearing paired longitudinal baculi more visible at the posterior portion and united near apex, forming a narrow arch posteriorly; apicalmost portion membranous, slightly expanded and bearing several sensilla at apex.

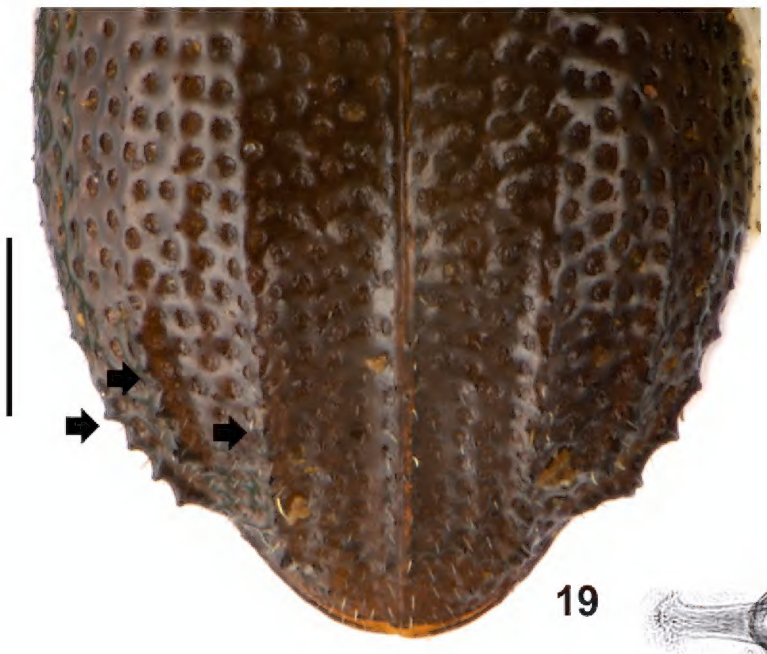
Measurements (in mm) and ratios (n = 17, including the holotype): TL 1.48–1.88 (1.64 ± 0.10), PL 0.50–0.60 (0.54 ± 0.03), PW 0.65–0.80 (0.70 ± 0.04), EL 0.95–1.28 (1.09 ± 0.08), EW 0.68–0.85 (0.76 ± 0.05), GD 0.65–0.85 (0.71 ± 0.05), PL/PW 0.74–0.81 (0.78 ± 0.02), EL/EW 1.31–1.61 (1.44 ± 0.07), EL/PL 1.75–2.29 (2.01 ± 0.16), GD/EW 0.87–1.00 (0.94 ± 0.04), TL/EW 2.03–2.32 (2.17 ± 0.08).

Material examined. Australia: holotype (ANIC) labeled "19.00S 146.12E, Paluma, QLD, 900 m, 11-vii-80, D. W. Frith [printed]\J. F. Lawrence, Lot 80–56, *Phellinus pectinatus* [printed]\ *Xylographella frithae* Souza-Gonçalves & Lopes-Andrade HOLOTYPUS [printed on red paper]". Paratypes: 18 specimens (2 males and 2 females) as follows: 3 specimens (CELC), same locality data as holotype; 5 specimens (3 ANIC; 2 CELC) "Paluma, QLD, 11

16

17

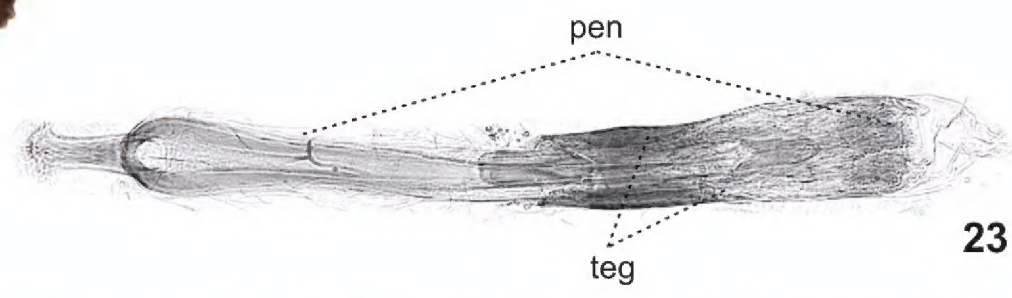
18


19

20

21

22



23

Figures 16–23. Holotype of *Xylographella frithae* sp. n. from Queensland, Australia: (16) dorsal view; (17) lateral view; (18) ventral view; (19) apical declivity of elytra; (20) left metatibia. Dissected male terminalia of paratypes: (21) sternite VIII; (22) tegmen; (23) aedeagus showing tegmen (teg) and penis (pen). Scale bars: 0.5 mm (16–8); 0.2 mm (19); 0.1 mm (20–23).

July 1980, D. Frith [printed]\J. F. Lawrence, Lot 80–56, *Phellinus pectinatus* [printed]"; one male (CELC, dissected) "Paluma, QLD, 11–12 Dec. 78, D. Frith [printed]\J. F. Lawrence, Lot 78–203, *Nigrofomes melanoporus* [printed]"; one specimen (QMBA) "NEQ: 16°31'S x 146°16'E, Mt Lewis Rd (Hut), 14 July 1996, 1200 m, G. B. Monteith, *Pyrethrum*, trees [printed]\QUEENSLAND MUSEUM LOAN DATE: March 2001 No. LE 01.11"; one female (CELC, dissected) "Mt. Lewis, 8 Km NW of Julatten, N. QLD, 8 Jan. – 2 Feb. 1987, R. Storey & H. Howden [printed]"; one specimen (ANIC) "Mt. Lewis, 800 m, QLD, 26 Dec. 1986, H. & A. Howden, flight intercept trap [printed]"; one specimen (CELC) "17.27S 145.29E QLD, Hugh Nelson Rg. GS3 1150 m, 1 Dec. 1994 – 3 Jan. 1995, P. Zborowski, FI Trap JCU (East) [printed]"; one male (ANIC, dissected) "Hugh Nelson Ra., 21 Km S Atherton, N. Qld, 1.xii.1983 – 9.1.1984, Storev & Brown [printed]\MDPI Intercept Trap. Site No. 16 [printed]\On loan from: Dept. Prim. Industries Mareeba, Qld. Aust. [printed on green paper]"; one specimen (QMBA) "Mossman Bluff Track, 5–10 Km W. Mossman N. Qld, 20 Dec 1989 – 15 Jan 1990, Monteith, Thompson & ANZSES Site 6,860 m, flt. intercept [printed]\QUEENSLAND MUSEUM LOAN DATE: Dec. 2001 No. LE 01.29 [printed on green paper]"; 3 specimens (one CELC, dissected female; 2 ANIC) "Mossman

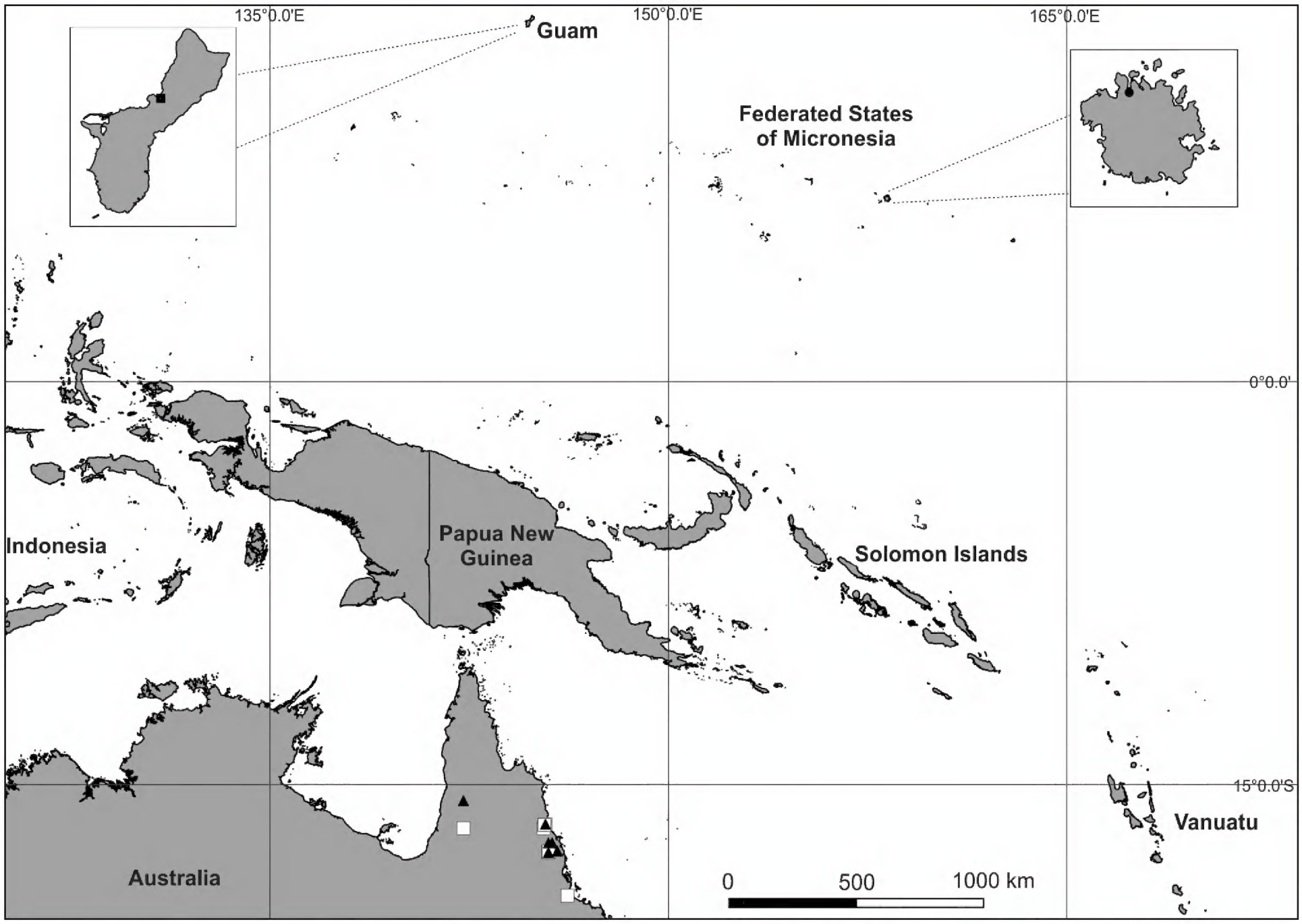


Figure 24. Distribution of the new species of Xylographellini in the Australian and Oriental regions, and new record for *Scolytocis samoensis* Blair from Guam: *Sc. australimontensis* sp. n. (black triangle); *Sc. insularis* sp. n. (black circle); *Sc. samoensis* (black square); *X. frithae* sp. n. (white square).

Gorge, NP QLD, 6 Km SW of Mossman 50 m, 11 July 1982, S. & J. Peck, SBP6 [printed]\J. F. Lawrence, lot 82–28, *Nigroporus* [printed]". All paratypes are additionally labeled "*Xylographella frithae* Souza-Gonçalves & Lopes-Andrade PARATYPUS [printed on yellow paper]".

Host fungi. *Phylloporia pectinata* (Klotzsch) Ryvarden (Hymenochaetaceae), two records; *Nigrofomes melanoporus* (Mont.) Murrill (Polyporaceae), one record; *Nigroporus* Murrill (Polyporaceae), one record.

Etymology. The new species is named in honor of the ornithologist Dawn Whyatt Frith, who collected all specimens from the type locality. The species name is Latinized from "Frith" using the feminine suffix in the genitive singular (*-ae*).

Remarks. This is the first described species of *Xylographella* from the Australian region. The genus encompasses only two other species: *X. punctata* Miyatake, 1985 and *X. speciosa* Lopes-Andrade, 2008, the former from the Japanese islands of Honshu and Shikoku, and the latter from the provinces of Mindanao and Luzon in the Philippines. Images of *X. frithae* were recently provided by Lawrence (2016).

ACKNOWLEDGEMENTS

We would like to especially thank John Francis Lawrence for giving us the opportunity to work on these Xylographellini and to the staff of ANIC for managing the loan of ciids. We also thank two anonymous reviewers and the associate editor Ângelo P. Pinto for valuable corrections to the text. The senior author I.S.G. thanks the Graduate Program in Ecology (Universidade Federal de Viçosa, Brazil) for the academic support during his master degree. Financial support was provided by Fundação de Amparo à Pesquisa do Estado de Minas Gerais (FAPEMIG; Edital 01/2016 – Demanda Universal, APQ-02675–16), Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq;

research grant to the junior author C.L.A., 307116/2015–8) and Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES; master degree grant to I.S.G.).

LITERATURE CITED

Araujo LS, Lopes-Andrade C (2016) A new species of *Falsocis* (Coleoptera: Ciidae) from the Atlantic Forest biome with new geographic records and an updated identification key for the species of the genus. Zoologia 33: e20150173. https://doi.org/10.1590/S1984-4689zool-20150173

Blair KG (1928) Heteromera, Bostrichoidea, Malacodermata and Buprestidae. In: Insects of Samoa and Other Samoan Terrestrial Arthropoda. Part 45. Coleoptera. Fasc. 2. British Museum (Natural History), London, 67–109.

Lawrence JF (2016) The Australian Ciidae (Coleoptera: Tenebrionoidea): A Preliminary Revision. Zootaxa 4198: 1–208. https://doi.org/10.11646/zootaxa.4198.1.1

Lawrence JF, Ślipiński A, Seago AE, Thayer MK, Newton AF, Marvaldi AE (2011) Phylogeny of the Coleoptera based on morphological characters of adults and larvae. Annales Zoologici 61: 1–217. https://doi.org/10.3161/000345411X576725

Lopes-Andrade C (2008) An essay on the tribe Xylographellini (Coleoptera: Tenebrionoidea: Ciidae). Zootaxa 1832: 1–110.

Lopes-Andrade C, Grebennikov VV (2015) First record and five new species of Xylographellini (Coleoptera: Ciidae) from China, with online DNA barcode library of the family. Zootaxa 4006: 463–480. https://doi.org/10.11646/zootaxa.4006.3.3

Lopes-Andrade C, Lawrence JF (2005) *Phellinocis*, a new genus of Neotropical Ciidae (Coleoptera: Tenebrionoidea). Zootaxa 1034: 43–60.

Lopes-Andrade C, Lawrence JF (2011) Synopsis of *Falsocis* Pic (Coleoptera: Ciidae), new species, new records and an identification key. ZooKeys 145: 59–78. https://doi.org/10.3897/zookeys.145.1895

Miyatake M (1985) Ciidae. In: Kurasawa Y, Hisamatsu S, Sasaji H (Eds) The Coleoptera of Japan in Color, 3. Hoikusha, Osaka, 278–285.

Morrone JJ (2015) Biogeographical regionalization of the world: a reappraisal. Australian Systematic Botany 28: 81–90. https://doi.org/10.1071/SB14042

Submitted: 9 December 2016
Received in revised form: 10 February 2017
Accepted: 26 February 2017
Editorial responsibility: Ângelo Parise Pinto

Author Contributions: ISG and CLA participated equally in the preparation of this article.
Competing Interests: The authors have declared that no competing interests exist.